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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,955	12/20/2001	Satoru Mayuzumi	NEC 01FN061	4588

7590

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EXAMINER

IM, JUNGHWA M

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/036,955

Applicant(s)

MAYUZUMI, SATORU

Examiner

Junghwa M. Im

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of claims 1-16 in Paper No. 5 is acknowledged.

### ***Claim Rejections - 35 USC § 112***

Claims 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In each of these claims, "said side walls" has unclear antecedent, because claims 1, 2, and 3 recite "a side wall," which is singular, and "said side walls" is plural.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-4, 6, 11, 13-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al.

With respect to claim 1, figure 3E of Gardner et al. shows a device comprising substrate 100, gate insulation film 302, and gate electrode 304, having a portion increasing in length in the upward direction. 306, 308 form a side wall, formed on a side

surface of the gate electrode, that is covered behind a top part of the gate electrode as seen from above. (If "formed on a side surface of said gate electrode" is construed narrowly to mean "touching" the gate electrode, then the portion of layer 302 that does not lie between the gate electrode and the channel region can be included as part of the "side wall." See also figure 2C, where side wall 204 touches gate electrode 202.) An interlayer insulation film covering the gate electrode and contacting the side wall would have been obvious as shown by insulator 508 in figure 5, in order to support upper layers including a gate contact electrode 512, which is necessary for a functioning device.

With respect to claim 3, side wall 306, 308 is a lamination of oxide and nitride (column 6, lines 33-42), which have different "etching properties."

With respect to claims 4 and 6, the gate electrode 304 has a lower part of constant length, and an upper part that increases in length in the upward direction.

With respect to claims 11 and 13, each of the side walls has an upper part 306 of oxide formed on a side surface of the upper part of the gate electrode, and a lower part 308 of nitride, formed on a side surface of the lower part of the gate electrode.

With respect to claims 14 and 16, the side surface of the upper part of gate electrode 304 is tapered.

Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. as applied to claims 1, 3-4, 6, 11, 13-14, and 16 above, and further in view of Satoh et al.

Figure 4C and 4E of Satoh et al. show gate electrode shapes that have a "visor part," or a part overhanging the lower part of the gate electrode with substantially constant length. The purpose of the gate electrode shapes taught in this reference is to diminish capacitance (see the paragraph spanning columns 4 and 5) and to aid in forming LDD extensions for source and drain (figures 8A-8C). It would have been obvious to adopt the gate electrode shapes taught by Satoh et al. in fashioning the Gardner device for either of these reasons.

Claims 2, 5, 10, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. as applied to claims 1, 3-4, 6, 11, 13-14, and 16 above, and further in view of Kim.

With respect to claims 2 and 10, the cover figure of Kim shows contact 60b, extending from gate electrode 30b1 to drain region 40b, and contacting the vertical side wall of the gate electrode. It would have been obvious to include a similar contact in the Gardner device, in order to implement an SRAM cell having this particular circuit connection of gate shorted to drain, as discussed at Kim column 4, lines 28-37.

With respect to claim 5, the Gardner gate electrode 304 has a lower part of constant length, and an upper part that increases in length in the upward direction.

With respect to claim 12, each of the Gardner side walls has an upper part 306 of oxide, and a lower part 308 of nitride, as noted above.

With respect to claim 15, the side surface of the upper part of the Gardner gate electrode 304 is tapered.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner and Kim as applied to claim 1-6 and 11-16 above, and further in view of Satoh et al.

As noted above with respect to claims 7 and 9, Figures 4C and 4E of Satoh et al. teach the "visor" overhang for a gate electrode, which would have been obvious to diminish parasitic capacitance and to aid in formation of LDD regions, as taught by Satoh et al.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (703) 305-3998. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for TC 2800 are (703) 308-7722 (regular communications) and (703) 308-7724 (After Final communications).

  
Sara Crane  
Primary Examiner